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The Perception of Health Professionals of the Information System of Continuous Care

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Abstract

Health organizations seek to use Information and Communication Technologies (ICT) in a more agile and functional way, to contribute to the support of professionals of the area and to users: this way, it is possible to guarantee the quality and sustainability of Information Systems (IS). IS that needs to adapt and restructure, given the exponential development of ICT in response to the increased need for Health Care. It is necessary to align the current realities of the business processes in Health, namely in Integrated Continued Care Services, and the technologies in use, so that information becomes available at the time and place of decision-making situations. So, this research is determined to study the Integrated Continued Care Information System, from the health professionals point of view. The main objective is to understand if employees comprehend the platform and know how to use it. Also, to understand their degree of satisfaction, the degree of information system appropriation, the main differences and similarities in its use among the different health professionals. In the end, a proposal for the IS improvement is made.

This study was carried out in two phases: first in the Health Center Group of Lisbon and Oeiras and after at Egas Moniz Hospital. The first phase is characterized by gathering information on the informatic application. The second phase is based on a descriptive exploratory study using questionnaires. The results of this study may be useful for improving Integrated Continued Care Information System, as well as increasing user satisfaction. This study allows to understand the health professionals needs regarding Integrated Continued Care Information System and its necessary improvements, namely the need to involve healthcare professionals as part of the strategy, implementation and promotion of care.

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Keywords: Integrated Continued Care; Referencing; Information System; GestCareCCI, Efficiency.

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1. Introduction

Healthcare depares with a paradigmatic and socio-demographic shift. It has emerged in recent years [1]: the demand for healthcare characteristics changed [2] to fill gaps in health care and social support and meet the needs of the aging population. So, the National Health Service (NHS) had to create solutions to make the current healthcare system works [1] [3]. Thous, the National Network of Integrated Continuous Care (RNCCI) was created, which became an essential tool to overcome the crisis [4] [5]: it was possible through the network, assist patients in home situations of dependency and relocation situation overcoming some issues. Due to the increased healthcare needs and with the exponential development of technology, it's necessary to adapt and restructure the IS in order to support the activity, being fundamental that the technologies are aligned with the current realities and with the processes [6].

With this diversity and increased of medical information, a question emerged: how to use health knowledge to improve the quality of health information and the quality of healthcare organizations [7]. For the success of this RNCCI proposal, is essential that a flow of information between healthcare units and their destination exists, so provision of healthcare is carried out efficiently [4]. Using Information and Communication Technologies correctly, should be possible to support healthcare professionals and users, to monitor the health and their lifestyles, to treat diseases and prevention. Also, it is indispensable to increase agilitzation and functionality in health systems with tools, and therefore guarantee the quality and sustainability [6]. The IS is a very important instrument, which contributes to develop informational strategies for health [8]. The software application is a most important support key, which benefits health facilities due to the increase services' efficiency, quality, safety and efficiency, and access to users [6]. To ensure the safety and quality of delivery of healthcare, it is essential that communication between the network systems, are timely and effective, to avoid situations of failures or short circuits, as these problems can cause errors or delays in the user treatments [4] [5].

In this point of view, it is pertinent the study of IS issues between different professional groups and especially due this aspect lack of exploitation, even if it has a great impact on healthcare services and in efficient solutions. It is also relevant to study the Integrated Continued Care Information System because it is used by most of the professionals: it is crucial to analyze the IS situation in the user perspective, in order to demonstrate impacts, limitations and aspects to improve. From the data presented in this investigation, those responsible for the system can correct or create strategies to optimize the application itself. It will also consider that this study can be a contribution to the development and continuing improvement of IS's procedures. So, the goal of this study is to understand the healthcare professionals approach in using the Health Center and Hospital computer system. It aims to develop knowledge, understanding the similarities and differences between user's applications (doctors, nurses and social assistant workers), assess satisfaction of its users and the IT platform for the efficiency of Integrated Continued Care Information System and finally carry out a proposal for improvement. The results of this study can contribute to a better applicability of IS of the Integrated Continued Care Information System, in order to ensure the effectiveness, satisfaction, improvements in quality of system usage and therefore, the applied care. To achieve these goals, there was a descriptive exploratory study, and applied a questionnaire to users of computing plataform, within the Health Center Group of Lisbon and Oeiras and after at Egas Moniz Hospital pulmonology service, held in the months from April to September 2015.

1.1 Referencing

The referral process for RNCCI patients, implies five operational levels, including High Management Team (EGA), Health Center, Local Team Coordinators (ECL), Coordinating Regional Teams (ECR) and finally the Central Administration of Health Services (ACSS), focuses on the monitoring and regulation of the [8] [5] [11]. The access to RNCCI is done in two keys, through the proposal of the Integrated Continued Care Teams in Health Center or EGA in hospitals [9] [10] [4].

The patient referral starts with registration in the SI, that is, in GestCareCCI with the creation of a process during the first 48 hours after admission or 48 hours before the expected date of discharge (if care to be provided at home) within the hospital EGA responsibility. If the patient becomes to have home health care, he will be signaled by the professionals of Team Continuous Care Integrated (ECCI). The assessment is carried out through the joint of doctor assessment, nurse and social assistant worker, embodying the diagnosis of a dependency situation. After this procedure the patient is properly documented, when the network admission assessment is complete and is verified the type of

care that the patient needs. The process is transferred through the computer application to the competent authority of ECL (the area of residence), where is evaluated the type, and the criteria set by the EGA or home-based team and is validated the proposed referral [9] [10] [11] [12]. ECL of the preferred residential area of the user, validates the proposal, with or without corrections, highlighting the user to the ECR where it assess the needs of health care and social support, identifying and assigning a place to the patient [9] [10]. The patient ends up hospitalized in the chosen unit, depending on the vacancies and resources and can sometimes be assigned at a place located in the Regional Health Administration (ARS), different from the local area where previous referenced [13].

So, the computer application GestCareCCI was created, to make it possible to carry out the referral of users. A basic need was identified: the IS is available at any time and in any place, as such, the solution created was the system found online via the web. This solution provides available and updated information, creating the "backbone of the system". Due to the need to integrate GestCareCCI with workflow management, it became available at any time and place [9]. In conclusion, the successful implementation of an IS helps to improve clinical practice in adapting health care, as well as increasing the effectiveness and efficiency of health organizations [14].

1.2 GestCareCCi (Monitoring System Referencing RNCCI)

GestCareCCI is a system for recording and online monitoring. It as focus on the user: it functions as a single platform that integrates multiple solutions [15]. The IS is connected to two large databases, including the Social Security and National Users Registry. By web service, this operation in real time, it became possible to encompass all RNCCI, including ARS (ECR), Hospitals (EGA), Health Center (ECL), providers (Units and teams) and the Mission Unit for Continuous Care integrated (the current ACSS) from the Health Data Platform, providing access to all relevant information for the network, also, benefiting the intersectoriality and interface [16] [15] [8].

The GestCareCCI seeks some health gains where they are derived from the computer application at the level of the user response efficiency, quality of information, as well as from the financial dimension, facilitating the flow of information, ie, the decision-making, dialogue and transparency [8] [15].

2. Methodology

2.1 Objectives

The main object of this study, is to evaluate the applicability of the software system under the requirements of the Integrated Continued Care and its effectiveness. The specific objectives defined are:

- identify IS help in the Integrated Continued Care service;
- understand the perceived satisfaction of employees using this computer application;
- understand the differences and similarities between the professional category.

With these objectives, the aim was to achieve a good analysis and construct a proposal for a maximization of the used computer application (GestCareCCI), seeking the contribution of its procedures and effectiveness in the area of Integrated Continued Care. By a research option, the computer application was studied from the viewpoint of business and Health Center or Hospital.

2.2 Research Questions

The research question of this study was:

What is the perception of health professionals of integrated on health continuous care using the information system?

To be able to answer this question, the following research sub-questions were considered:

- The information system is adequate to the needs of the service?
- The long-term care information system is really effective?
- There are differences and similarities among computer users of the application?
- Health care professionals are satisfied with the application?

2.3 Data Collection, Data Analysis Technique and Data Handling

According to the general objective, and in specific with this project, to analyze the computer application, the research was completed in two phases: in the first phase the construction of the questionnaire was made through field notes; in the second phase we applied the questionnaire, which aims to understand the suitability of the system, the differences and similarities, efficiency and satisfaction of its users.

In the first phase, we selected hospital nurses EGA and some nurses who work with the application in the pulmonology department, to collect field notes. In the second phase, the questionnaire was distributed at the Health Center Group of Lisbon and Oeiras and after at Egas Moniz Hospital was applied.

The questionnaire was made based on ISO: 25010/2011 and through field notes gathered from informal conversations with nurses. To conduct the research instrument, it was developed a script in the form of questionnaire for each user, mixed, with short-answer questions and open-responses [17]. This instrument pretended to collect the following variable data: gender, age, professional category unit where he/she works, period of time working in the unit, GestCareCCI data characterization, training, application used, layout/graphic aspect, functionality, performance, accuracy, reliability and reliability of information, effectiveness, efficiency, interoperability, safety, quality, satisfaction, other information, and overall satisfaction.

We conducted a pre-test in order to check if all the questions were understandable by the inquirees, if the closed questions had all the possible answers and if the language is easy to understand [17]. The delivery and collection of the questionnaires was done personally during the months from April to May 2015 in hospital. Regarding Health Center 120 questionnaires were delivered from May to September 2015, to collect 90 questionnaires completed, with 8 of them excluded: 7 because inquirers don't use the software application and 1 because a single psychologist were not a significant sample (n = 1).

After data collection, analysis started. To do so, it was used descriptive and inferential statistics, as well as association tests. Krukal Wallis and the Mann Whitney tests were the ones used. As significant differences in the Kruskal Wallis test were found, it was necessary to perform the Mann-Whitney test, to be able to detect in which groups are these differences. In the association analysis, the Spearman correlation test was used.

3. Results

3.1 Characterization of computing platform users

The sample of this study, consisted of 82 participants, comprising 19 doctors, 54 nurses, 9 social workers, where the majority are female (84.1%), and the rest are male (15.9%).

In relation to age, participants have between 28 and 62 years old, with an average of 41.10 (SD = 9,624). 21 out of the 82 participants did not answer to this question.

With regard to the period of time that health professionals working in the unit, most worked over 3 years - 76.8%, then between 2 and 3 years - 9.8%, working between 1 and 2 years 4.9%, within one year - 7.3 % and finally some participants did not answer the time working in the unit (1.2%). For the period of time that professionals working with information technology platform, they answered, using the application over 3 years - 41.5%, from 1 to 2 years - 22%, from 2 to 3 years - 17.1%, less than one year - 17.1% and some professionals did not answer (2.4%).

3.2 Characterization of Information GestCareCCI data

The results for the second part of the questionnaire, ie, the characterization of computer application where health professionals mention what options they frequently use, are here exposed.

Each health worker in their workplace uses both modules to register, as to query data. In this study, it is observable that the most used modules are reviewed nursing (76.8%), medical assessment (62.2%), pressure ulcers - scales Branden (61%), assessment and risk for pressure ulcers (59.8%), the user ID (59.8%), assessment of the risk of falls / morse (56.7%), pain assessments (53.7%) and Integrated Avaliation Instrument (50%).

Note that there are modules with little use, including household (6.1%), contract (4.9%), drug adverse reactions (3.7%), diaper consumption records 2.4%, contract history (2.4%), plug user (2.4%), infection record (1.2%), co

estimate (1.2%), creating the user record (1.2%) and privileged telephone contacts (1.2%). The chat and e-learning are not used by health professionals.

Also, is evident that health professionals use the application mainly to reference the user (91.5%) also use it to see the process of the patient from the first episode on the network (79.3%), consulting administrative data of the patient (58.5%) read patient discharge reports (45.1%) and view other user's admissions (41.5%).

Related to the referral of the patient to the RNCCI, it is emphasized that the participants consider theprocedure performed on the computer platform to be effective (74%), the rest (23.2%) do not consider it effective.

From the 19 users that consider the referral procedurenot effective, they referred it to be a lengthy procedure (26.3%), bureaucratic (15.8%), confused (15.8%) platform and a complex procedure (15.8%).

3.3 Platform technical point of view, in perspective of users

In fact, most users didn´t have training. In 82 participants, only 12 users had training, eventhough it was considered sufficient for this study.

As view in the application utilization time, most users used 1 hour on average once a week for up to 2 hours per day.

Regarding the layout, they didn´t posicioned themselves if the graphical environment had an attractive look. Most users have immediate understanding of platform, although they are dissatisfied with the form that information was exposed.

In the feature, the application displays all the necessary information for those who do not give an opinion. Most consider the GestCareCCI has all the required fields, and state that the application meets the needs of professionals in occupation.

Relatively to performance, the application sometimes provides information that professionals need quickly. Sometimes satisfaction comes with the speed that application demonstrates for the professional activity.

Regarding the impact in work environment has on performance, users had not position. Users evaluate on their belief that system performance is normal.

In the accuracy consider that the application provides the correct information. Do not position if they are satisfied with the accuracy of information.

When it comes to reliability and reliability of information, the platform information is not always updated, occurring system failures. They do not know if it's possible to recover data in case of failures.

With respect to efficacy, they not position themselves if they can achieve the proposed objectives for the professional activity.

Looking for efficiency, they do not consider the system neither easy or difficult, but also neither slow nor fast to use.

Regarding interoperability, they use other systems in the medical record. Is consider essential to have interoperability because it improves the process, saves time, avoids duplication and lack of information. This coordination of data, between hospital and Health Center and sometimes this joint works well.

Looking to security, most users stated that the application is secure.

For the quality, the application is suitable for occupation. But there is no motivation to use and implementation to improve needs.

The system has as main limitations the lack of interoperability, the duplication of records, too many fields, some slowness of own processing, some lack of information, a list of diagnostics diseases inefficient in the professional activity. The main points, users considered the application should be improved are: interoperability, pathologies listing, optimization of information, intuitive application and information registration.

When it comes to satisfaction, they not position if application is reliable and has quality. Health professionals, in case of doubts or computer problems with certain aspects of the platform, say that they must ask for help, mainly to nurses and service colleagues. Most of all, in general, professionals are satisfied with the GestCareCCI.

3.4 Discussion

The discussion of results starts with the answer to the research question and sub questions, to understand the

perception of health professionals of the Integrated Continued Care Information System used.

Users of GestCareCCI have not position themselves in relation to the application to be effective if they can achieve the proposed objectives for the professional activity using the system, system efficiency and system slowdowns. Let's see by the following questions:

-There are differences and similarities among computer users of the application?

- Doctors, nurses and social workers consider safe and of quality the application's implementation.
- Also, doctors and social workers, consider that the graphic environment have an attractive look, they understand the system, are satisfied with the way the information is presented, fells that the work environment has an impact on the functional performance, are satisfied with the accuracy information, can achieve the proposed objectives for professional activity using the system - so the application is appropriate.

-The health professionals are satisfied with the application?

Generally:

- They are dissatisfied with the way the information is presented;
- Although, the application meets the needs of professional activity;
- Only sometimes professionals consider themselves satisfied with the implementation of speed;
- Do not position themselves whether they are satisfied with the accuracy of the information;
- To consider that the application meets the needs of professional activity;
- They are not motivated to use the GestCareCCI;
- The degree of satisfaction on the system in the professional activity, is satisfied.

3.5 Proposed Improvements

Facing the analysis and discussion exposed, we made an improvement proposal and verify some aspects that do not depend on the IS itself. The improvements found concern the structure and technical aspects of the application, computer procedures and some ones unrelated to IS (more organizational) as well as data that professionals introduce in the application. The dimensions of this study were divided into the following categories: interoperability, list of pathologies/diagnostics, interface, registers, formation, password, referencing, data recording, historical data, consult history, nursing evaluation, medical evaluation, social assessment, psychological evaluation and other assessments/family assessment.

For example, in the software, the system is barely functional, objective, practical and efficient. It should be improved with network interconnections. To solve this issue, the process of filling the application form should be simplified when referring to the user: thus, improve network and communication technologies as well as network servers.

In the records, the description / evaluation of the user is repeated by many health professionals, causing duplication of records. The amount of duplicated information between the various evaluations should be reduced. To achieve that it's necessary identify the key priority levels of the different items of information and assessment.

With respect to references, the process is too bureaucratic. It should be possible to view all users of the unit marked on the network - a user is signaled when it is referenced, that is, registered in RNCCI.

While browsing the historic registation, we can not see all file of the user, or see the user's data, without going to the same record. Should be allowed to query data without having to enter the card for each user and also be able to view the health historic of the patient, even if the return to RNCCI. The application should have different access levels.

In relation to append data, the application should have the functionality to be able to attach clinical reports and user information records. It would be essential to have the ability to attach reports and other data as well as allow attach key documents. This system would follow the example of the electronic health record and go on to have a site that integrates information from departmental systems, whose function is to file the clinical history of users, surgeries, hospitalizations.

Concerning of data recording, there is no warning to record when making the network referral of the user and when it submits the information, and the information is also insufficient. To address this situation should be possible to store the information before submitting or write, without losing data. As well as generate alerts or notifications is a functional requirement that should exist in the application.

4. Conclusion

In conclusion, there are studies related to the IS of the Integrated Continued Care. However, the comparison results become complex due to the absence of correlational data about the system under the perception of its users. The main objective of this research was to better understand the software application from the perspective of health professionals and create a proposal for improving the system. In general, health professionals are satisfied with the software application as well as it is adequate and meets the needs of the professional activities of the Integrated Continued Care.

Regarding to efficiency or effectiveness, the health professionals who use the system don't have opinion. In this study, it was found that professionals are dissatisfied with the way the information is presented and are not motivated to use the system. To optimize system, some aspects could be applied, in particular a new element must have training and must exist a training responsible in the units. Nowadays training institutions is mandatory, including some of that time to teach users how to better work with the application and optimize their accessibility and care. It is essential that health professionals have adequate support in the use of technology to facilitate the use of SI.

To ensure continuous investment in quality of care and own computer system, is necessary that health care professionals have access to essential information on time of decision-making process, in a secure, clear and credible way [18]. With the proposed improvements, it was found that there are several aspects that do not depend on the SI itself. Some of major problems users reffered are the lack of interoperability and coordination between the GestCareCCI with other software, causing record duplication and increased task time. Another problem is the description and coding of clinical pathology that, unlike to other systems, do not follow the international classification. There isn´t a system in specific fields for psychological evaluations of users. The lack of mandatory fields indication sometimes causes insufficient information. Also, the system has no alerts, does not save data before submitting the request to RNCCI or make changes after the request for referral.

Finally, to be a perfect application, it is vital to have feedback from health care professionals, understand their needs in order to improve the use gains, ie, retrieving the full potential and advantages of SI, operate effectively the system and improve it.

5. Contribution and Future Studies

The major contribution of this study was to understand the system's weaknesses, aspects to improve and the proposed improvement. Through the data presented in this research the system responsibles can create strategies to optimize the application and provide the system for a better organization.

The results of the study may contribute to a better applicability of IS of the Integrated Continued Care to ensure the effectiveness, satisfaction, improvements in quality of system usage and therefore in the applied care.

In future studies, it would be interesting to carry out a new investigation to understand the difficulties in this study still standing and / or if the professionals are made aware and more satisfied with the application.

Extend this study to other Health Center and hospitals, as well as other locations to realize the differences by regions, by professionals and services.

Or study the IS within the Integrated Continued Care Units or the point of view of organizational management or the IS itself.

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